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**From:** Fullagar, Jill [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=7BA061353C314B40A14A8BE1EE382AE3-GABLE, JILL]  
**Sent:** 9/11/2017 11:02:09 PM  
**To:** Mark Healy [markhealy@coquilletribe.org]  
**Subject:** RE: Literature on Ocean Acidification in Oregon

Hi Mark,

Sorry for my delayed response. I was out of the office for a couple weeks when you sent this.

Thanks so much for passing this along. I'll take a look at the articles and make sure they are included in our review. While there are a lot of articles documenting the impacts of OA on different species, it has been a challenge to determine how to apply that information to an impairment determination given the narrative nature of the water quality standard that would apply, and the fact that much of the data has been collected in laboratory settings or other locations, rather than in ambient Oregon waters. We will continue to review new literature and data as it emerges, though, and appreciate you adding to the body of work we should be considering. We will look at these before we take any final action.

Please let me know, at any time, if you have additional concerns or questions, and always feel free to send any information you come across to me. I'll be sure to copy you on our final action, which will include a response to all the comments we received.

Thank you,  
jill

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Jill Fullagar, Impaired Waters Coordinator  
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fullagar.jill@epa.gov

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**From:** Mark Healy [mailto:markhealy@coquilletribe.org]  
**Sent:** Monday, August 28, 2017 9:42 AM  
**To:** Fullagar, Jill <Fullagar.Jill@epa.gov>  
**Subject:** Literature on Ocean Acidification in Oregon

Jill,

I know this is very late. The public comment request for Ocean Acidification did not cross my desk until I started to get info on the OR 2012 Integrated report from EPA. I am sending a few articles and links from Dr. Shallin Busch that could be added to the summary of OA impacts.

My opinion as a staff person, not representing the Tribe's position, is that the OA issue needs to be addressed in the Oregon water quality standards. However, if Oregon cannot *do* anything about OA, which is likely, would calling the on-shore ocean areas impaired for OA be appropriate, knowing there is nothing that *can* be done about it?

I think the Oregon estuaries could possibly be modified to improve OA, but then the complex dynamics of the estuary would make it very difficult to address with a water quality standard.

We have acclimated up to 100,000 coho smolts for ten years now and for the last two years we have not seen a single adult return to our reservoir. Something about the current ocean conditions is causing them to stray, die, or get eaten.

These are 2017 articles that should be added to the OA literature list.

Coho can get lost and can't smell predators

<http://kuow.org/post/salmon-are-losing-their-sense-smell-thanks-carbon-emissions>

<http://www.fondriest.com/news/study-finds-salmon-sense-of-smell-is-impaired-by-freshwater-acidification.htm>

Impact to the Dungeness fishery

<https://www.nwfsc.noaa.gov/news/features/ocean-acidification-west-coast-dungeness-crab-fishery/>

Fish getting smaller

<https://www.scientificamerican.com/article/warming-waters-could-mean-smaller-fish/>

Mark

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**From:** Colin Beck

**Sent:** Wednesday, August 16, 2017 2:41 PM

**To:** Mark Healy <[markhealy@coquilletribe.org](mailto:markhealy@coquilletribe.org)>

**Subject:** FW: Consultation Invitation for OR 2012 Integrated Report

Can you look into this and let me know if they're planning on adding any waterways that are in our service area?

Colin

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**From:** Fullagar, Jill [<mailto:Fullagar.Jill@epa.gov>]

**Sent:** Wednesday, August 16, 2017 2:13 PM

**To:** Colin Beck <[ColinBeck@coquilletribe.org](mailto:ColinBeck@coquilletribe.org)>

**Subject:** Consultation Invitation for OR 2012 Integrated Report

The attached consultation invitation was sent to your Tribal Leader last week. Please let me know if you have any questions. Thank you.

Best,  
Jill Fullagar

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